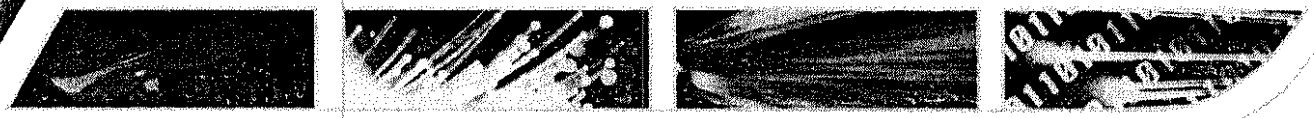
DECLARATION OF QUINTIN LEW

EXHIBIT 11

TIME WARNER TELECOM

THE POWER DRIVING YOUR NETWORK



Investor Presentation
February, 2005

Safe Harbor Statement . . .

Statements made during today's presentation may include certain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements are based on management's current expectations and are subject to risks and uncertainties. These risks include the risks summarized in the Company's filings with the SEC, including the section entitled "Risk Factors" in its Annual Report on Form 10-K and those set forth in Item 8.01 of its Current Report on Form 8-K dated February 3, 2005.

Time Warner Telecom Inc. is under no obligation, and expressly disclaims any obligation, to update or alter its forward-looking statements whether as a result of new information, future events or otherwise.

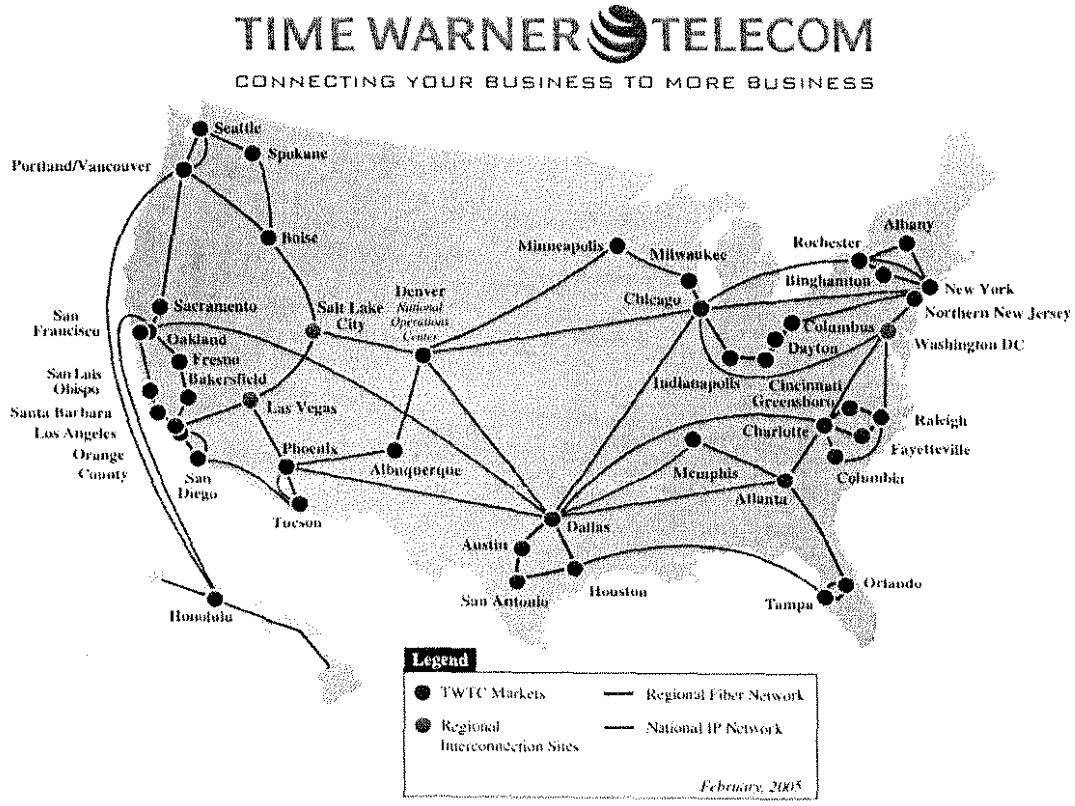
TIME WARNER TELECOM

THE POWER DRIVING YOUR NETWORK

Company Overview

Local Networks Integrated w/ National IP Network . . .

- Local company with a national presence
- Network Integrator
- Complex data & voice solutions
- Local and regional fiber facilities
- Nat'l IP backbone
- Delivering better value



Our Unique Assets . . .

The Network (1) --

- Fiber facilities – over 19,000 route miles
- Ethernet leadership
- Last mile local loop
- Lit fiber to over 5,000 buildings
- Network proximity to thousands of buildings
- National IP backbone – provides diverse connection of metro networks

Its Value --

- Supports industry-leading technologies, products and solutions
- Quality of Service for demanding enterprise customers
- Diverse alternate network
- Meets multi-location needs of our customers
- Increased control over margins

(1) As of December 31, 2004

Company Focus . . .

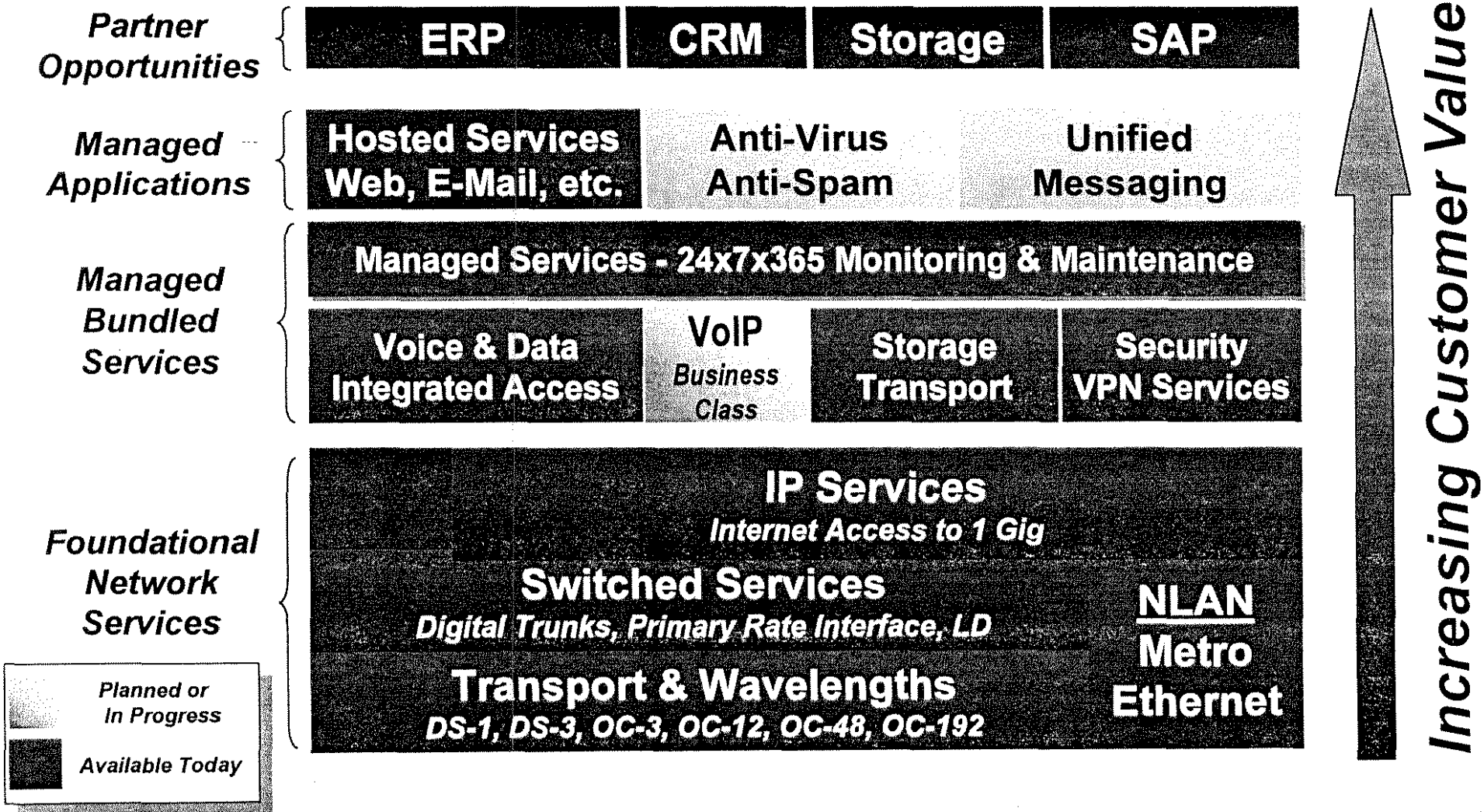
- Lever extensive local fiber networks
- Drive all segments of our business
- Achieve operational efficiencies
- Deliver highest quality customer care and innovation
- Expand service offerings

TIME WARNER TELECOM

THE POWER DRIVING YOUR NETWORK

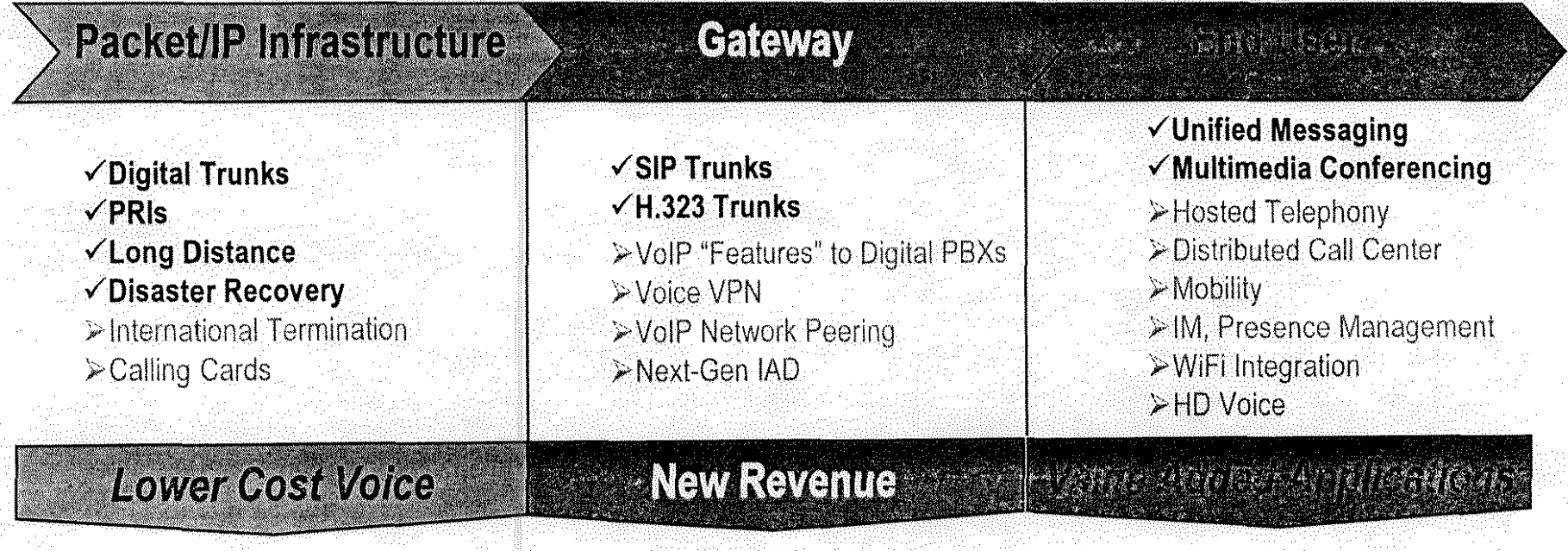
Product Overview

Products and Services Evolution –
Bundled Services, Increasing Share of Wallet



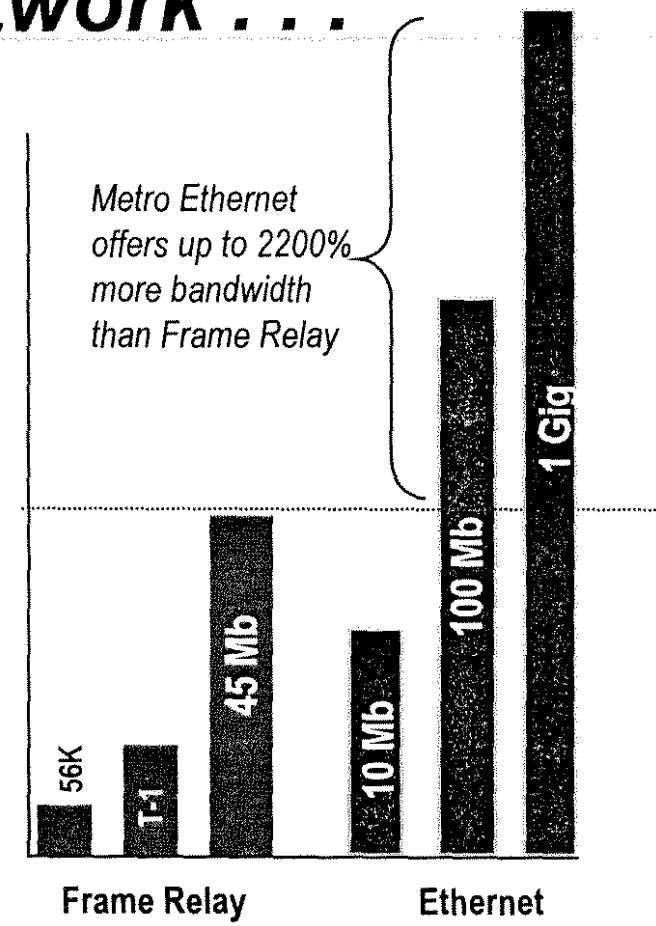
Our VoIP Product Strategy . . .

- *Rapidly develop and implement new services that create new and incremental sources of revenue*
  - Cap Legacy Switching Infrastructure – Grow Next-Gen Capabilities
  - Implemented Traditional Services Driving New Revenue
  - Implement Value Added Services, Creating Customer Loyalty, Stickiness



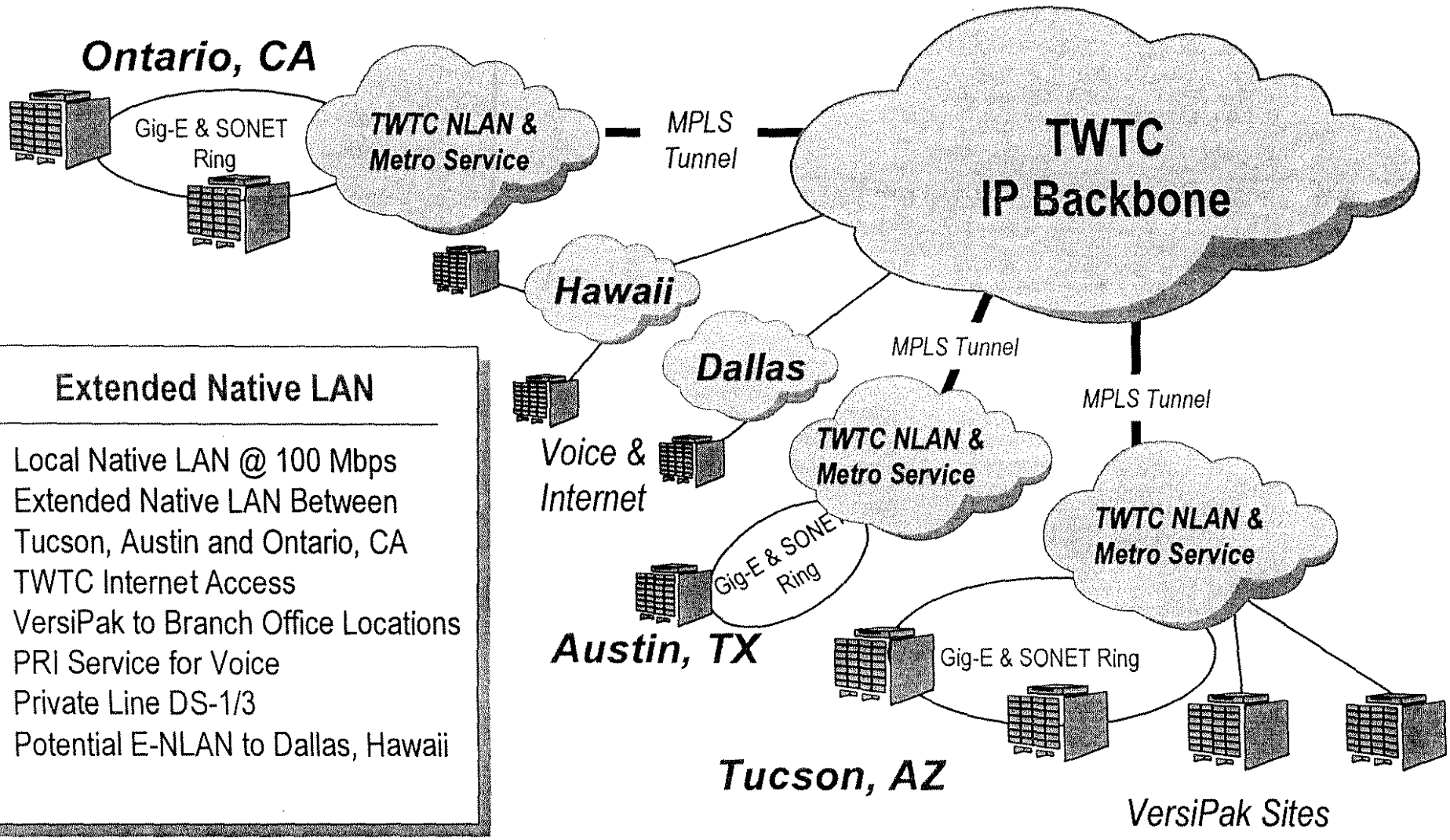
Why Ethernet Is the New Public Network . . .

- *Pervasive – It's Everywhere In The Enterprise*
  - Networking technologies around for over 30 years
  - LAN components - Highly commoditized
    - Built into virtually all PCs
    - Ports available to nearly every business desktop
    - In every router, switch at a fraction of the cost of a SONET or DS-n interface
- *Familiar to Customers*
  - Virtually all businesses use Ethernet
  - Known and understood bandwidth management
    - Can carry both Voice and Data
- *Highly Scalable*
  - 10 Megabits per second to 10 Gigabits – TODAY!
  - 10 Meg = 6 T-1s; 1 Gig = 24 DS-3s or 672 T-1s



A Logical Migration of LAN → Wide Area

Large Enterprise Solution -- Extended Native LAN Service



Extended Native LAN

- ✓ Local Native LAN @ 100 Mbps
- ✓ Extended Native LAN Between Tucson, Austin and Ontario, CA
- ✓ TWTC Internet Access
- ✓ VersiPak to Branch Office Locations
- ✓ PRI Service for Voice
- ✓ Private Line DS-1/3
- ✓ Potential E-NLAN to Dallas, Hawaii

We offer a better value & solution . . .

TWTC Offers a Lower Total Cost of Ownership

- ***Can't Do This Application With Frame Relay***
- ***Lower CPE Cost for customer***
- More than 40% Less Expensive than RBOC Private Line
- More than 40% Less than RBOC ATM

Native LAN Value

- Plug 'n Play
- Ethernet ports typically in place
- Highly Scalable (well beyond Frame Relay)
- 2 Mb to 10 Gig
- Robust Internet Access
- Easily Layer on Additional Applications
- Voice over IP Platform
- Ethernet Ports Much Less Expensive

Issues For Our Competitors

Fiber deployment to end-user buildings

Metro Ethernet requires new infrastructure deployment

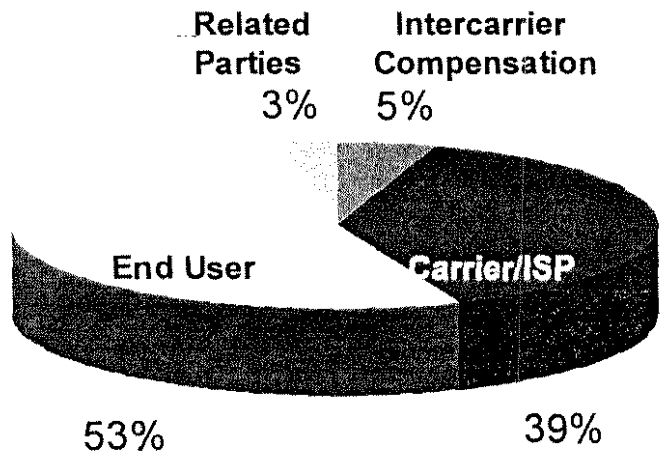
Cannibalizes Frame Relay and ATM network service revenues

TIME WARNER TELECOM

THE POWER DRIVING YOUR NETWORK

Financial Overview

Higher Quality Customer & Revenue Mix [1] . . .



	A year ago	*Today*
Enterprise/End Users	48%	**53%**
Carrier & ISP	41%	**39%**
Related Parties [2]	5%	**3%**
Intercarrier Compensation	6%	**5%**
	100%	**100%**

(1) Adjusted revenue for the three months ended December 31, 2004 and 2003.
(2) Related parties include Time Warner Inc. and the Advance/Newhouse parties.
(3) For a reconciliation to GAAP related numbers please see the supplemental fourth quarter 2004 earnings information on the Company's website, www.twtelecom.com.

Quarterly Revenue Mix . . .

$ in millions	2003				2004			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Adjusted Revenue [1]								
Enterprise	$66.9	$72.3	$74.3	$76.2	$78.9	$81.6	$83.9	$88.9
Carrier								
Carrier & ISPs	64.4	60.5	64.4	60.9	58.9	61.3	59.1	60.9
WorldCom	11.7	8.9	5.4	4.7	5.0	4.8	4.7	5.1
	76.1	69.4	69.8	65.6	63.9	66.1	63.8	66.0
Related Parties	7.7	7.7	9.4	8.6	5.6	5.1	4.6	4.6
Service Revenue	150.7	149.4	153.5	150.4	148.4	152.8	152.3	159.5
Inter-carrier Comp.	14.3	13.4	9.9	9.8	10.9	10.0	8.3	8.5
Adjusted Revenue	$165.0	$162.8	$163.4	$160.2	$159.3	$162.8	$160.6	$168.0
Adj. Modified EBITDA [1]	$48.7	$50.2	$50.5	$49.7	$49.3	$55.2	$51.6	$54.6
Adj. Modified EBITDA Margin [1]	29%	31%	31%	31%	31%	34%	32%	33%

(1) The Company has revised the title of EBITDA to Modified EBITDA, however the calculations remain the same, for more details see our Earnings Press Release. Adjusted Modified EBITDA excludes MCI settlements and reciprocal compensations settlements.

(2) For a reconciliation to GAAP related numbers please see the supplemental fourth quarter 2004 earnings information on the Company's website, www.twtelecom.com.

Sequential Quarterly Revenue

$ in millions

	Q4 03	Q3 04	Q4 04	Sequential Change %	YoY Change %
Adjusted Revenue [1]					
Enterprise	$76.2	$83.9	$88.9	6%	17%
Carriers & ISP					
Carrier & ISPs	60.9	59.1	60.9	3%	-
WorldCom	4.7	4.7	5.1	9%	9%
	65.6	63.8	66.0	3%	1%
Related Parties	8.6	4.6	4.6	-	(47%)
Service Revenue Subtotal	150.4	152.3	159.5	5%	6%
Inter-carrier Compensation	9.8	8.3	8.5	2%	(13%)
Adjusted Revenue	$160.2	$160.6	$168.0	5%	5%
Adjusted Modified EBITDA [2]	$49.7	$51.6	$54.6	6%	10%
Adjusted Modified EBITDA Margin [2]	31%	32%	33%		

(1) Excludes MCI and reciprocal compensations settlements.
(2) Excludes MCI and reciprocal compensation settlements and $7 million of one time cost savings in Q4 2002.
(3) For a reconciliation to GAAP related numbers please see the supplemental fourth quarter 2004 earnings information on the Company's website, www.twtelecom.com.

Yearly Revenue Mix . . .

$ in millions	2002	2003	2004	2004 over 2003 $	2004 over 2003 %
Adjusted Revenue [1]					
Enterprise	$237.1	$289.7	$333.3	$43.6	15%
Carriers & ISP ...					
Carrier & ISPs	274.7	250.2	240.2	(10.0)	(4%)
WorldCom	67.0	30.7	19.6	(11.1)	(36%)
	341.7	280.9	259.8	(21.1)	(8%)
Related Parties	31.8	33.4	19.9	(13.5)	(40%)
Service Revenue Subtotal	610.6	604.0	613.0	9.0	1%
Inter-carrier Compensation	65.9	47.4	37.8	(9.6)	(20%)
Adjusted Revenue	$676.5	$651.4	$650.8	$(.6)	0%
Adjusted Modified EBITDA [2]	$163.1	$199.0	$210.8	$11.8	6%
Adjusted Modified EBITDA Margin [2]	24%	31%	32%		

[1] The Company has revised the title of EBITDA to Modified EBITDA, however the calculations remain the same, for more details see our Earnings Press Release. Adjusted Modified EBITDA excludes MCI settlements and reciprocal compensations settlements.

[2] Excludes MCI settlements, reciprocal compensation settlements, and $7 million in one time cost savings in 2002

[3] For a reconciliation to GAAP related numbers please see the supplemental fourth quarter 2004 earnings information on the Company's website, www.twtelecom.com.

Capital Expenditures . . .

- Investing in the future
  - Building expansions
  - Network and new product expansions
  - Information Technology and Corporate Infrastructure
- Guidance for 2005
  - $160 to $175 million in capital expenditures

Financial Summary . . .

- Growing enterprise revenue with high value-added customer solutions
- Relatively stable carrier business
- Strong Modified EBITDA Margins: 33% today
- Gaining capital efficiencies by leveraging the network
- Strong liquidity

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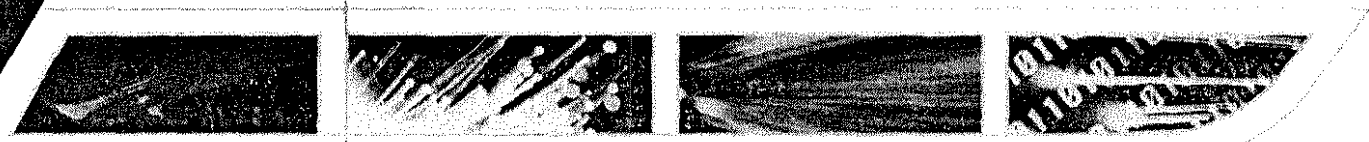

Questions & Answers

DECLARATION OF QUINTIN LEW

EXHIBIT 12

Lew Decl. - Exhibit 12

GLOBAL internetworking

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Home | About Us | Media Room | Contact Us

Solutions for: Carriers & Service Providers | System Integrators & VARs | Enterprise & Government Clients

GII Services: | Request a Quote | pop2pop.com℠ | The GII Process

About Us

- Company Overview
- Why Global Internetworking?
- Executive Profiles
- Policies & Legal Requirements

Company Overview

Global Internetworking, Inc. (GII), founded in 1998 and headquartered in McLean, Virginia, provides high-capacity data transport and bandwidth solutions to carriers, service providers, systems integrators, government agencies and medium- to large-sized enterprises. The company, a facilities-neutral telecom carrier and network solutions provider, was created to address a number of significant needs and critical issues facing the industry, including:

- Hundreds or even thousands of facilities-based carriers from which to choose;
- No existing system for individual companies to effectively manage the many available data transport and bandwidth options offered by these carriers; and
- The need for a single carrier-neutral entity assuming end-to-end responsibility to deal with multiple carriers involved in an integrated solution.

To address these critical issues, GII chose to identify and leverage the network assets of facilities-based carriers, rather than build-out its own network.

The company also developed the systems and assembled a team of networking experts to streamline the process for provisioning, pricing, network design, planning and management. The objective -- to provide outstanding service and optimal solutions.

With this approach, organizations looking for data transport services and network solutions are no longer required to do their own search for a particular facilities-based carrier or carriers to meet their needs. GII does it for them -- providing a solution strictly based on a customer's requirements, not the limitations of a particular network. This generally results in reducing costs and delivering customer-specific solutions in a more timely manner.

To that end, the company has developed a proprietary database to analyze the network infrastructure and pricing of hundreds of underlying carriers that reach central offices, points-of-presence, and lit buildings throughout the U.S. and international metro markets in dozens

Signup for GII Newsletter

Become a Global Internetworking Wholesale Network Supplier

of countries.

GII customers are able to access real-time price quotes for GII services via the web at pop2pop.com[SM] for U.S. and international private lines. pop2pop.com[SM] also provides real time quotes for IP access throughout the U.S. and for Ethernet service in select U.S. markets.

The company addresses customer support through a Network Operations Center (NOC). Through the NOC, GII provides 24x7 end-to-end management and trouble resolution for customers and acts as a single point of contact with all underlying carriers that may be involved with a customer's service.

Services and solutions that Global Internetworking provides include:

- U.S. Private Line;
- Private Line Multi-Hub;
- Gateway Hub Service;
- International Private Line;
- IP Access and Transit;
- Ethernet;
- Wavelengths;
- Colocation;
- Managed Network Services;
- Network Design/Engineering Support;
- Network Cost Optimization;
- Network Diversity Planning; and
- Wireless Backhaul Optimization.

To learn more about the advantages Global Internetworking offers, **click here.**

Lew Decl. - Exhibit 12

About Us

Company Overview

Why Global Internetworking?

Executive Profiles

Policies & Legal Requirements

Why Global Internetworking?

Global Internetworking, Inc. (GII) delivers outstanding service and customer-centric high-capacity network solutions to its customers – which include some of the world's leading carriers, service providers and bandwidth-intensive businesses.

It begins with GII's ability as a facilities-neutral provider to offer a single point of management and interface to multiple network providers.

A Team of Experts Support a Single Point of Contact

GII customers no longer need to worry about working with multiple carriers, multiple contracts and multiple service levels, or whether their services will be delivered on time.

With GII, you receive a single point of contact for service provisioning and management. The process continues with having our team of networking experts, proprietary provisioning and service management systems in place to deliver customer-specific solutions quickly and cost-effectively.

Our Systems Assure an Optimal Solution

Our CMD℠ Operations Support System and proprietary database of hundreds of carriers enable us to analyze network infrastructure and pricing quickly to identify an optimal solution. This means GII experts can create solutions that provide customers with the network and vendor diversity they require, as well as the most appropriate combination of long-haul and local access to manage costs and provision services on time.

GII's proprietary systems are used to track, plan and manage service delivery from the moment a customer places an order to service turn-up and ongoing maintenance and

management. Customers have web access to interface with our CMD[SM] system so they can easily track the status of their order and more. Global Internetworking customers also receive real-time price quotes for private lines, IP access and Ethernet services through our pop2pop.com[SM] web portal.

GII Simplifies the Process

GII's commitment to outstanding customer service continues with our Network Operations Center (NOC) through which GII provides 24x7 end-to-end management and trouble resolution. With the Global Internetworking NOC, customers no longer need to work with multiple carriers to resolve service issues. GII handles that as a single point of contact for its customers.

Global Internetworking simplifies the process for our customers. That's why world class carriers, service providers, systems integrators, government agencies and large enterprises have turned to GII for their networking requirements since its founding in 1998.

Lew Decl. - Exhibit 12

Executive Profiles

Michael Keenan
Co-Founder and CEO
mkeenan@globalinternetworking.com

Michael Keenan is a co-founder and the Chief Executive Officer of Global Internetworking. He has over twenty-five years of experience building, managing and investing in successful businesses.

Since co-founding Global Internetworking in 1998, Keenan has guided it to consistent revenue growth, profitability and positive cash flow, and has made it the leading provider of facilities-neutral high-capacity data transport solutions.

From 1996 to 1998, Keenan was the general partner and lead investor in Main Street Investments, a private investment group which actively managed a portfolio of commercial and residential real estate assets, as well as investments in various early-stage technology companies.

From 1980 to 1995, Keenan founded and managed two multi-state mechanical contracting service businesses. In his capacity as President and CEO, he was responsible for managing the companies' strategic initiatives, building its sales, marketing and service delivery teams, as well as leading them to double digit revenue growth and profitability. Keenan sold both businesses in a Wall Street roll-up. The roll-up was later sold to a subsidiary of the ServiceMaster Company in 1998.

He has a B.S.B.A. in Finance from the University of Colorado. Keenan serves on the boards of several businesses and non-profit organizations and is a member of the Potomac

Officer's Club and the Northern Virginia Technology Council.

Todd Vecchio
Co-Founder and President
tvecchio@globalinternetworking.com

Todd Vecchio is a co-founder of Global Internetworking and has worked full-time on company activities since 1998. He conceived of Global's facilities-neutral, knowledge-based business model, and has played a key role in the development of Global's strategy ever since. He has over twelve years of telecommunications industry experience. Under Vecchio's direction, GII's sales growth continued despite the 2000 to 2004 downturn in the telecommunications industry.

From 1997 to 1998, Vecchio was Vice President of Sales for Atlantic Media, Inc., a competitive long-distance provider that was acquired by Lightwave Communications, Inc. From 1992 to 1997, Vecchio was a Senior Account Manager with Bell Atlantic (later Verizon), where he was responsible for sales to enterprise business accounts.

Mr. Vecchio holds a Bachelor of Science degree in Business Administration from Mary Washington College.

Raymond Wiseman
Co-Founder and Vice President of Network Support
rwiseman@globalinternetworking.com

Ray Wiseman is a co-founder of Global Internetworking and Vice President of Network Support. He has worked full-time on company activities since 1998. Wiseman has over 20 years of experience designing, installing, testing, and delivering high capacity services.

As a co-founder, Wiseman's initial responsibilities were to develop Global's back-office capabilities and establish operational relationships with key customers. He oversees GII's provisioning, network support activities and directs Global's network management activities. Wiseman is also responsible for addressing all Tier 3 customer provisioning and maintenance issues.

Prior to Global Internetworking, Wiseman worked for Bell Atlantic and AT&T. In that capacity, he had both field and management responsibilities for voice and data switching

and transmission equipment installation, wiring, power systems and environmental controls found in both long-haul tandem offices and local central offices.

At AT&T Network Services (later Lucent) Wiseman was responsible for testing, configuration, installation and repair of AT&T's 5ESS, 4ESS and Digital Access X-Connect products. In this capacity, he supported customers such as AT&T Long Distance, Bell Atlantic, the U.S. Treasury, and U.S. State Department.

Gary Hale
Vice President of Global Operations
ghale@globalinternetworking.com

Gary Hale, Global Internetworking's Vice President of Global Operations, is an 11-year veteran of the telecommunications industry.

He is responsible for planning the development and operation of all technology within Global Internetworking and for assuring quality service levels for its customers. He also has responsibility for Global's internal and external information technology requirements, network design, support, engineering and operation.

Prior to Global Internetworking, Hale held senior network management positions within MCI and UUNET. At UUNET, Hale was key to the planning, implementation and operation of UUNET's international expansion and helped UUNET become one of the leading IP providers in the world. At MCI/WorldCom, he was assigned responsibility for global network management for all of MCI's Internet networks. In this capacity, he supported MCI Internet networks in the U.S., Asia, Pacific Rim, Canada, Latin America and Europe.

Mr. Hale holds a Bachelor of Science Degree in Mathematics from Virginia Tech.

John G. Hendler
Vice President of Sales
jhendler@globalinternetworking.com

John G. Hendler is the Vice President of Sales for Global Internetworking. He brings 25 years of sales and sales management experience in the telecommunications industry to the Company.

He is responsible for the development of Global Internetworking's go to market channel strategy and all Global sales.
Prior to joining Global Internetworking, Hendler served in various executive level sales positions within MCI, including most recently as the National Director of MCI's Mid Market Program.

Prior to that, he was the Vice President of Wholesale Account Development and the Vice President of Global Wholesale for MCI WorldCom. In these positions Mr. Hendler was responsible for generating and maintaining wholesale revenues through the development, and implementation of various domestic and international programs. Additionally, Hendler served as a Vice President for MFS International, where he was responsible for spearheading the growth of the company's International wholesale organization. He also has held prior sales management positions within Sprint, and Metromedia<>ITT Long Distance.

Mr. Hendler received a Bachelor of Arts degree in History from Wake Forest University in Winston-Salem, North Carolina where he was a 4-year member of the Wake Forest Basketball team.

Andrew Goldsmith
Vice President of Marketing and Strategic Planning
agoldsmith@globalinternetworking.com

Andrew Goldsmith is the Vice President of Marketing and Strategic Planning for Global Internetworking. He brings ten years of telecommunications, marketing and strategic planning experience to the Company.

He is responsible for strategic planning, product and corporate marketing, and business development.

Prior to Global Internetworking, Goldsmith served as Vice President of Marketing for Exostar, Inc., an Aerospace and Defense e-commerce services firm. While at Exostar, he helped launch the company's e-procurement, e-sourcing and e-collaboration solutions.

Prior to Exostar, Mr. Goldsmith was a consultant with PricwaterhouseCoopers in their telecom and media industry consulting practice and then with AppNet, Inc.'s strategy consulting group.

Goldsmith is a member of the board of the TelecomHUB, and networking organization for senior telecom professionals in the Washington, D.C. area. He has spoken at a variety of telecom and technology industry events and has authored articles for Communications News, Fat Pipe Magazine and other technology publications.

He earned an MBA from the University of Chicago and a BA from Columbia University.

Mike Romano
Vice President and General Counsel
mromano@globalinternetworking.com

Mike Romano, Global Internetworking's Vice President and General Counsel, is responsible for oversight of the company's legal and regulatory affairs. His duties include negotiating commercial contracts such as sales and vendor agreements, real estate leases, nondisclosure agreements, teaming agreements, distributor contracts, and dispute settlements. He also advises internal clients with respect to contractual and regulatory obligations as they relate to Global Internetworking's business, including human resources matters, the structuring of transactions, strategic initiatives, and product development and deployment.

Prior to joining Global Internetworking, Mr. Romano worked as legal counsel at America Online, Inc., Level 3 Communications, and with the Swidler Berlin LLP law firm. At America Online, he provided legal advice to business units and business development clients and was responsible for negotiating technology transfer and systems integration transactions, software and other intellectual property licensing agreements, and professional and technical services arrangements. At Level 3, he provided legal and regulatory advice and advocacy in support of the expansion of the telecom company's competitive modem and VoIP service offerings throughout the United States, and he also oversaw the negotiation, implementation, and enforcement of interconnection and traffic exchange agreements with other telecom carriers. At Swidler Berlin, his responsibilities included representing telecom clients before state public regulatory commissions and the Federal Communications Commission and in intercarrier negotiations.

Mr. Romano received his Juris Doctor degree from the Georgetown University Law Center and his Bachelor of Arts degree from Middlebury College.

Michael Avis, CPA

Controller
mavis@globalinternetworking.com

Mike Avis came to Global Internetworking in 2001 and is responsible for managing GII's accounting and finance department. His duties include the implementation of all internal and external financial reporting. His responsibilities also include strategic planning, budgeting & forecasting and dealing with tax compliance issues. He oversees the accounts payable process--which involves analyzing and auditing network cost--and the accounts receivable process. Avis also has responsibility over organizational development issues.

Avis came directly from Winstar, were he was a Senior Accountant responsible for analyzing network line cost, city profitability and capacity efficiencies. His telecom background also includes two years with MCI, where he was a Senior Accountant working directly in corporate accounting. His responsibilities included reviewing and analyzing departmental budgets. Later, Avis became a Senior Analyst of Revenue.

Before entering the Telecom industry, Avis was the Controller of a Washington, D.C. based printing company which later was purchased by IKON Office Solutions. At IKON, Avis served as the Regional Market Controller.

Mike Avis is a CPA with a Bachelors Degree in Business from Mary Washington College, and Accounting from the University of Maryland.

DECLARATION OF QUINTIN LEW

EXHIBIT 13

Lew Decl. - Exhibit 13

fSONA Signs Global Procurement Agreement with Bechtel

Vancouver, Canada – December 2, 2003 – fSONA Communications, an award-winning supplier of free space optical (FSO) communications equipment, announced today the signing of a Global Procurement Agreement with Bechtel, a premier provider of engineering, construction, and management services worldwide.

"Bechtel is an exceptional company with an impressive number of projects," said fSONA's CEO & President, Theresa Carbonneau, "fSONA is pleased to be able to help Bechtel serve their customers. The SONAbeam™ series is quickly and economically installed, and therefore we believe it is especially suited for deployment in areas that lack infrastructure."

"We are pleased to add the SONAbeam™ product line to our approved portfolio of available network products," said Jake MacLeod, Principal Vice President and Chief Technology Officer of Bechtel Telecommunications. "FSO systems provide high bandwidth at a fraction of the cost of fiber optic cable. Additionally, the time for deployment is drastically reduced when compared to placement of fiber optic cable. We believe FSO technology will provide specific solutions for short haul, high-capacity communication links in both private and public sectors. In particular, FSO technology can be utilized in emergency restoration of communications systems."

Bechtel Telecommunications has been using the fSONA SONAbeam™ 155-M free space optics link at their Frederick, MD headquarters office for over a year and a half. The link provides connectivity at 100 Mbps Ethernet speed or more than 100 times the speed of a broadband DSL line from the headquarters building to conference center facilities across Route I-270, Maryland's busy technology corridor.

Bechtel Telecommunications analyzes free space optics technology, along with other leading-edge technologies, in its laboratories. In December 2002, the Bechtel Telecommunications Technical Journal published an article entitled "Free Space Optics: A Viable Last-Mile Solution." The report, written by Vaidyanathan Ramasarma, concludes that "Optical Wireless is a mature and reliable approach for broadband access. FSO systems offer a viable solution toward building optical connectivity in a cost-effective, quick, and reliable manner."

About Bechtel
Bechtel Corporation is a privately held company headquartered in San Francisco, California, with approximately 44,000 employees, more than 50 offices worldwide, and 2002 revenues of $11.6 billion. Bechtel Telecommunications, a unit of Bechtel Corporation, provides design, engineering, project management, and construction management for a full range of telecommunication systems, through major offices in London, Shanghai, and its world headquarters near Washington, D.C. For more information, visit www.bechtel.com or www.bechteltelecoms.com.

About fSONA

fSONA Communications was founded in 1997 to deliver wireless solutions for carrier, service provider and enterprise networks around the world. The SONAbeam™ series of free space optical (FSO) networking products use an unlicensed, wireless technology operating at speeds up to 2.5 Gbps and distances up to 5km. SONAbeam™ avoids the cost of digging to lay fiber, licensing for radio frequencies, is immune to interference, and is extremely secure. SONAbeam™ is operational in 26 countries around the globe and was named Product of the Year by Network Magazine. For more information visit www.free-space-optics.org

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The Journal for Wholesalers, Resellers, and Agents of Communications, Computing, and Content Services

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CARRIER CHANNEL

Fixed Wireless Round Two

Metro Wholesalers Step Back in the RF Ring

By Khali Henderson

Fixed wireless was once a darling of the tech boom. CLEC hopefuls Teligent Inc., Winstar Communications Inc. and Advanced Radio Telecom Corp. hitched their wagons to its rising star in hopes of shortcutting the trench-digging path of their rivals by deploying fiber over the air.

The tech bust was a final blow to a

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business model plagued with problems, including high customer equipment costs, complex RF installations, difficulty securing building rights of way and point-to-multipoint technology that did not work as advertised. All three local multipoint distribution service (LMDS) operators filed bankruptcy in early 2001; Teligent emerged in early 2002 and Winstar was bought out of Chapter 11 by IDT Corp..

While in practice fixed wireless has been unpredictable, its appeal has never waned. Over the past three years, technology has improved and momentum has grown for fixed wireless services most notably in the license-exempt bands. While much of the recent fervor has been around LAN applications for fixed wireless (a.k.a. Wi-Fi), metro carriers are revisiting MAN applications for broadband wireless to fill in coverage and bandwidth gaps for enterprise customers. Seeing this opportunity, carrier's carriers and experienced fixed wireless operators are beginning to roll out wholesale offers.

LMDS license holder XO Communications Inc., for example, has dusted off the licensed spectrum it purchased in 1998 as NextLink and as part of its acquisition of WNP. XO's LMDS spectrum in the 27GHz- 32GHz range covers 95 percent of the population in the top 30 U.S. cities. In the early days of LMDS, XO watched as its would-be competitors struggled. Explains Mark Salter, the company's vice president of broadband wireless: "Multipoint gear was key to the play and, by and large, it did not work. We fell back to point-to-point, which wasn't scalable and more of a niche deployment and then stopped offering it."

That changed in 2003, when XO started working with vendors Ensemble Communications Inc. and Hughes Network Systems Inc., Salter says. He notes the carrier has deployed Ensemble's point-to-multipoint equipment and is testing Hughes. Today, XO has two

hubs in San Diego and one in Irvine, Calif.

Ensemble Communications, Fiberless system addresses frequencies from 10GHz to more than 40GHz and consists of three principle elements: the Fiberless 16200 Hub Station and associated radio antenna units, the Fiberless 320 Terminal Multiplexer and associated radio units and the Fiberless Management System. The company's patented Adaptix technology, which delivers real-time asymmetry, modulation and bandwidth on demand, forms the basis for the air interface portion of IEEE 802.16 standard adopted in December 2001. In addition, the Fiberless system's use of 25MHz or 28 MHz channels allows carriers to achieve burst rates up to 120Mbps and to serve larger areas with higher speeds to accommodate the varying traffic demands of business users.

Hughes Network Systems offers AIReach, which operates in frequency bands between 3GHz and 42GHz in point-to-multipoint or point-to-point deployments. AIReach consists of a multisector radio hub, remote stations installed on customer premises and a network management system.

Aside from working technology, XO's approach to the market opportunity is completely different from its failed predecessors, says Salter. For one, the company is taking a success-based approach to deployment instead of a "build it and they will come" strategy. "What the fixed wireless industry did before was build out hubs and end-user buildings before they got the revenue," he says. "We are building hubs, then selling the customer [tenant] and then building out the building."

XO also works with the tenant to secure roof rights from the landlord. Salter says, in most cases, they are able to secure them without having to pay a fee or share revenue with the property owner. Another critical departure from the old business model is

that XO is competing not against copper-based TDM services but against larger data pipes from T1 to DS3. "Fixed wireless enables us to do what copper cannot," says Salter. He explains it allows XO to offer 5mbps to 100mbps connections. T1s offer 1.5mbps with the next step, DS3 (28 T1s) at 44.7mbps.

XO is rolling out its fixed wireless services directly and through other carriers that would resell it to end users. A handful of smaller carriers have resold it, says Salter. Since XO's wireless hubs are connected to fiber, traffic is easily exchanged at the carrier hotel. Margins, he says, are better than what you could get from the Bells. He figures that at an average wholesale cost of $300 per month for special access, a T1 costs $200 per megabit. In contrast, the wholesale price for XO's 20mbps wireless connection is about $1,000 per month or $50 per megabit.

He adds the service can be up and running in less than 10 days. And, it's possible for XO to pass on information it pulls directly from the customer premise — something that can't be done with a T1.

The availability of unlicensed bands enables metro carriers to set up their own fixed wireless connections, but Salter says, "RF is a different engineering subject than most telcos want to deal with," and that unless they are doing a lot of deployments, it is difficult to scale the operation. He says interference on license exempt spectrum prevents them from being carrier grade.

NextWeb Inc., which utilizes 5.8 GHz for its broadband wireless network, argues such claims are misconceptions. "The first issue is the system must be well-designed, with directional antennas and frequency channel selection: any fixed wireless system that is poorly designed, licensed or unlicensed, will be unreliable," according to FAQs on the company's Web site. "The second issue is

most cases of interference in unlicensed bands have occurred at the densely populated lower ISM frequencies: 900MHz and 2.4 GHz, where there is less path attenuation and directional antennas are more difficult to deploy because they are much larger. NextWeb staff have not experienced any interference problems in the higher 5.8 GHz ISM or UNII bands."

David Williams, vice president of marketing and business development for NextWeb, says NextWeb provides the SLAs that you would expect: 99.99 percent up time with 50ms latency and packet-loss guarantees that mimic top carriers "This is not a best efforts-type service," he says.

NextWeb base stations are installed on highrise building rooftops and use wireless access units with sectorized directional antennas to provide the wireless access hub connection. Each unit typically allows a three-mile range, offering coverage over a 28-square-mile area. Up to 250 subscriber units can be deployed per sector, with user throughput of 25mbps, dynamically allocated among users, upstream or downstream. Total maximum capacity per base station is 155 Mbps (OC3). NextWeb wireless base stations are interconnected using either DS3 or OC3 connections back to one of two NextWeb Regional Data Centers where Next- Web maintains peering and transit with multiple global backbones. On the customer premise, a subscriber unit is placed on the roof or behind a window with line-of-sight to a base station within three miles. In addition to housing the antenna, the subscriber unit also contains the customer-end gateway router, so it is ready to be connected to the suscriber's LAN or firewall.

Using this architecture, the NextWeb network spans more than 800 square miles with access to more than 60 cities and 30,000 business locations throughout the San Francisco Bay Area, Silicon Valley and Orange County. "As we continue to push north into Los

Angeles, we will have coverage in all the key markets in the state of California," says Williams, noting the broader footprint is what carriers want. The company began offering wholesale services in April 2003 after it joined the SkyWeb Alliance with fellow California broadband wireless Internet providers SkyPipeline Inc. and SkyRiver Communications Inc.

While each SkyWeb Alliance member operates in a distinct geographical region, each can sign new customers on any other portion of the network, essentially allowing each member to benefit from full ownership of the entire network. Connectivity ranges from 512Kbps fractional T1 speeds to 10Mbps (six times the speed of a full T1).

"That partnership has been successful, but it also has given us insight into the issues faced by larger carriers," such as requiring larger coverage areas and streamlined provisioning tools, says Williams.

Like XO, NextWeb also is counting on its turnkey offer to entice landline carriers to add broadband wireless. "It's difficult to do on their own," says Williams, who notes there is a real opportunity for them to expand their service offerings. "A company that uses PacBell or SBC copper could use our wireless capability to bring new products to market not tied to the limitations of DSL," he says, citing video conferencing or VoIP running over a 2mbps wireless connection at half the cost of a T1 and installed in a few days. Services scale up to 10mbps — for which there are no landline equivalents except DS3, "which you can do cost-effectively for individual customers," Williams says. Wholesale margins are above 35 percent, he says.

NextWeb has built a Layer 3 network so it can cross-connect to wholesale carriers, quickly offloading the wireless traffic back to its

customer's own facilities. NextWeb also can provide core network services in its footprint as well.

Williams says NextWeb is positioning its wholesale offer as an extension for fiber and larger backbone links as well as a local access alternative. An ISP looking for new products to sell could use fixed wireless where bandwidth is not available to fill gaps or to deliver circuits to end users along with content or value-added applications.

Another reason carriers might look to broadband wireless is for diverse networks for their clients. In that scenario, NextWeb also offers professional services to assist with such deployments.

Carrier's carrier OnFiber Communications Inc. also is helping its wholesale customers fill client-specific requirements with a fixed wireless solution. OnFiber uses license-exempt free-space optics and millimeter microwave technologies from Terabeam Corp. and fSONA Communications to complement fiber-optic networks it operates in 14 major metropolitan areas. Terabeam's wireless fiber solutions use high frequency MMW (60GHz radio frequency) and FSO (invisible light beam) technologies operating at speeds of 100Mbps to 1.25Gbps. The SONAbeam series of FSO networking products uses an unlicensed, wireless technology operating at speeds up to 2.5Gbps and distances up to 5 kilometers.

"Traditionally OnFiber has focused on fiber optics," says Boyd Chastant, senior product manager for OnFiber. "Increasingly, we are using freespace optics and millimeter microwave" to address deployments that are too complex or expensive.

Chastant says the greatest justification for using fixed wireless technologies is cost, such as running fiber across a highway or congested area. He adds it can be the only option in places where

there is a moratorium on new builds.

The occasions to use the technology have been few so far, says Chastant, who adds the carrier always is looking but, like XO, is interested only in success-based deployments. He is optimistic for its application, however, and says the company has integrated the fixed wireless technology into its existing network monitoring infrastructure so that it can provide a seamless picture of network health to its wholesale customers.

"We did significant testing to make sure it offered the reliability and monitoring back to our NOC in Texas," he says.

"Your network is only as good as the weakest link in the chain," he adds.

Links

Ensemble Communications Inc. www.ensemble.com
fSONA Communications www.fsona.com
Hughes Network Systems Inc. www.hns.com
IDT Corp. www.idt.net
NextWeb Inc. www.nextweb.net
OnFiber Communications Inc. www.onfiber.com
SkyPipeline Inc. www.skypipeline.com
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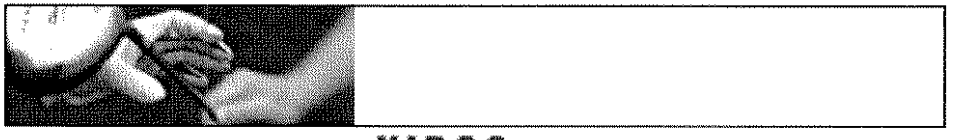

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Getting down to business: LOOKING FOR BIG MONEY, CABLE IS...

November 2003
CED Magazine
By Craig Kuhl, Contributing Editor

http://www.cedmagazine.com/ced/2003/1103/11a.htm for full story and artwork

Cable's great commercial market awakening is underway. From tall, shiny buildings to remote rural offices, the industry's marquee players and many of their little system brothers are seeing the revenue wisdom of providing business-class service to millions of SMB (small- to mid-size businesses) and larger enterprises.

And what a market it is. Most analysts peg the commercial market at between $85 billion and $100 billion. By 2008, more than 7.8 million SMBs and larger enterprise businesses will exist, with cable servicing 2.4 million of them through a variety of data, telephony and network managed services. And, over the next year, more than 50 percent of SMBs intend to switch to broadband, according to The Yankee Group's SMB Broadband Study.

Considering that most of those businesses are within a simple fiber strand or wireless extension of existing cable plant, and with a growing number of cable operators showing healthy ROI and revenue from their business services, most industry experts are convinced cable's commercial play is real, and quickly turning into a near no-brainer.

"For operators that have proven they're generating revenue, it's ludicrous that some haven't been doing it. They are already passing businesses that can be offered business service, and the only expense is segmenting the customer service of residential and business. There's lots of low-hanging fruit, and it's a proven revenue opportunity," says Lindsay Schroth, analyst for The Yankee Group.

Yet the cable industry currently ekes out about a five percent market share, at best, and for even the most foresighted, savvy business service groups at the major MSOs, revenues are more a trickle than a torrent. But there's a good reason why. "When new services like business come along, it changes the dynamics of sales, marketing, provisioning, customer service and the back office. It's difficult to form a corporate strategy. But in this case, the SMB market is well worth it," Schroth insists.

As appealing as the commercial market appears to be, transforming a traditional residential cable provider into a highly reliable, multi-service data and telephony business is no gimmee.

The business sector has high expectations, and reliability is paramount. Simply billing for the smorgasbord of business services can be a mind-numbing experience for novice business service groups at cable systems. Add to the mix a shift in marketing and sales mentality

versus the residential side, and the message to the cable industry becomes clear: Build the business plan and follow it, or get out of the way.

"Our whole strategy is disciplined growth, with each business having its own business case," explains Kevin Curran, senior vice president of product marketing and strategic sales for Lightpath, a wholly-owned subsidiary of Cablevision Systems. "We built the network one customer at a time and have averaged $100 million in annual capital expenditures to build it out. Our payback period is a few years, and by year-end 2003, we will be become free cash-flow positive. But it takes a very disciplined approach to growth into the market."

Lightpath, Curran adds, is expected to generate $500 million in revenue "in the next few years," and is currently looking hard at the $15 billion local and long-distance telephone markets. "If we capture 10 percent of that market, that's huge. We'll focus on a discrete number of businesses and where their regional phone needs are."

Other MSOs are following similar strategies. Cox Communications, arguably the leader in cable's commercial services arena, sees the commercial services business as a whopping $9 billion opportunity in its market exclusively. "We think we can service $3 billion to $4 billion of that market with systems already in place by leveraging our infrastructure. The business customer is very different, and the expectations are very keen, but we're significantly down the learning curve with customer service and commitment. It's an enormous business opportunity," says Bill Stemper, vice president of Cox Business Services.

Cox recently reported revenues of $230 million for its data and telephony business services, up 31 percent over last year. Its current strategy, Stemper notes, is to invest in "tall, shiny buildings" over the next few years and saturate its existing SMB markets. "Now we need more salespeople on the street, greater scalability, billing, etc., and we're prepared to make the investments."

Those investments can be pricey, especially for the hard-to-reach businesses. A coax or fiber connection to a distant business away from an existing fiber plant in Lightpath's market, for example, will cost about $40,000 per business, creating a tricky ROI challenge. Those distant businesses, however, can wait, most operators say.

"We're focusing on buildings close to our existing plant and will penetrate from there," says Ken Fitzpatrick, senior vice president of commercial services for Time Warner Cable. "We realized the opportunity to leverage our existing infrastructure and drive new revenue streams to business class, and high-speed data and tiered access are driving our commercial market. This is no longer an ancillary product; it's a growth segment and a very large opportunity for us."

Time Warner, Fitzpatrick adds, is concentrating on its SMB cable modem market of businesses under 100 employees. "With our facilities-based infrastructure, we can capture universities, government buildings, and more with data and communications services. We're also looking at the vertical markets like medical, insurance and hospitals, and to larger business enterprise customers and teleworkers."

At the local level, Time Warner-San Diego is experiencing solid growth. "The big push here is building out our network building by building. We will add 1,200 building passes of businesses this year and 2,000 next year--from legal firms to accounting offices. It really runs the gamut," says Fran Mingura, commercial services manager for Time Warner in San Diego.

Insight Communications, which has been serving the commercial market with business broadband service for several years, is pushing its business service deeper and wider into the enterprise markets, both small and large. Yet like most of its contemporaries, Insight is challenged by the cost of expanding a network to a business facility, and the transformation from a residential to a business-class mentality.

"The biggest cost is plant expansion, but it's not prohibitive with larger businesses. The smaller the business, the more costly. Growing the business as an extension of our existing cable business is the challenge. However, our overall commercial market is $1 billion, and we'll get our fair share of that by approaching it market-by-market," says Mike Page, senior vice president of telephone and data services for Insight Communications.

Even smaller cable operators are seeing the wisdom of offering business service to SMBs. In some cases, they're turning the small-business-first strategy on its head. "When we looked at the commercial market, we wanted to protect the large business turf first, so it's a different approach. Now, we've got 1,500 businesses and nearly 40 percent market share. We're very pleased with that segment," relates Joe Jensen, president of Buckeye TeleSystem, a Toledo, Ohio-based communications company serving 28,000 business customers.

For some MSOs, however, developing an effective SMB business plan continues to be a work in progress. Adelphia, for instance, while continuing its journey through a tedious bankruptcy process, is slowly assembling a business service strategy. "We're still trying to develop a commercial market strategy and have the fiber plant that we can leverage in the SOHO (Small Office Home Office) and small end of the business space. We'll be very opportunistic in going after those markets," says Karl Ossentjuk, vice president of Internet services product management for Adelphia Communications.

Comcast, the nation's largest cable operator, "remains almost exclusively focused on residential services," according to one research report. Nevertheless, Comcast is widening its commercial market strategy to include small business, teleworkers and larger businesses. "We've integrated our small business products into our Internet group and a top priority is business class support, so we have created a separate support group for them. We are in the beginning stages of taking advantage of this business opportunity and will begin to grow the SMB and teleworker markets next year. We're definitely behind this," maintains Suzanne McFadden, senior director of marketing for Comcast Online.

Yet even with the proven upsides of offering business class service, morphing into a multi-service provider to the business sector is challenging the fundamental business model of cable itself. Says Schroth: "Operators must understand new customer service requirements and how to support and sell the business service. Their success will depend on how well they break off from their core video business and move into business class service, quality of service and security."

Though not a given, cable's industry-wide success in the business service market is expected to happen, albeit in four to five years, experts acknowledge. Yet for its supporting vendor cast, it means a series of fundamental shifts as well. "It's (business class service) still very new to many (cable operators). And now the industry is about communications, not cable or video.

When you look at the business market segments, they're hard to avoid. SMBs are willing to pay $200 a month, but they want to be sure of reliability and availability. So for us, we have to be ahead of the deployment curve," admits Hilton Nicholson, president of IP cable business for ADC, a supplier of broadband services.

Scientific-Atlanta, for example, created its Emerging Businesses Group, which specifically targets the commercial market, and Motorola is investing substantial dollars in its engineering and product development process. "We've spent lots of engineering resources on redundancy and teams of engineers to support the MSOs' commercial markets, which they want to leverage on one network. It's not about disparate networks, but about standing ROI and leverage," says Jeff Walker, senior director of marketing for Motorola.

It's also about transforming a network into an efficient, reliable and available bundle of business services such as high-speed data, telephony and a host of ancillary and supportive business products such as file storage, e-mail, messaging and more.

"The industry is stepping up to business services and still thinking through and developing the business models, along with the best ways to build their networks in the current economic environment, while being smart with their capital expenditures and budgets. But they're gaining momentum," says Michael Pritz, president and CEO of Jedai Broadband Networks Inc., a supplier of broadband access technology to the cable industry.

And it's about time, some experts claim. "The first two years of rollouts were slow because cable operators didn't have the business market as a priority," acknowledges James Ratcliffe, director of strategic marketing and planning for Narad Networks Inc., a provider of business broadband solutions. "Now, the commercial rollout is accelerating. For us, it's now the number-one business opportunity, but we need to continue pushing our products forward and working with the MSOs to move the business segment forward."

Toshiba is also in the business services mix. It recently established its Digital Solutions Division to handle many of the commercial market issues. "MSOs are turning to vendors and asking: What else do you have that creates a value-add beyond the cable modem? It does put a strain on our engineering teams and we must make decisions on how best to invest our time and resources, so we're shifting our engineering resources to handle this new growth market," explains Chris Boring, communications manager for Toshiba America Information Systems Inc.

The results, however, could be dramatic for both MSOs and its supporting vendors. Adds Boring: "MSOs are looking at any service that can bring them incremental revenue and leverage their existing plant. This is a very significant change for them."

In this case, change is good. Concludes Paul Connolly, vice president and general manager of emerging businesses for Scientific-Atlanta: "The small business market is double the entire residential market, so cable doesn't need a big piece of the market to generate good revenues. So, it's clearly important for us to put an organization around it."

Others, such as Tropic Networks, which provides an optical layer that can deliver video, voice and data services to businesses, is also ramping up for what it believes will be an onslaught of business services delivered by cable companies.

"For the past six months we've been working with tier one operators and looking at some type of network management, which we believe they must have for business services so they can deliver services as quickly as possible and grow from there," says Rob Lane, vice president of marketing and business development for Tropic Networks Inc.

And growth is the optimum word. "Some MSOs are reluctant to talk about their business service plans and are very siloed, and it took awhile for companies like Cox to determine that the revenue was there for their business service. But it's there, and is a natural progression for MSOs. So why not extend to smaller businesses?," asks Schroth.

For cable operators and vendors alike, that question is being answered on a daily basis as more businesses sign up for cable's business services. Yet reaching the big time revenues associated with larger enterprise businesses and the majority of SMBs won't be easy.

Concludes Fitzpatrick: "We must separate ourselves from the residential service and learn how to deliver high-speed data, security, bandwidth and overall capabilities. And, we must constantly stay on top of new products, while driving the message home that cable means business."

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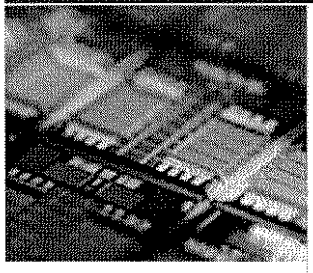

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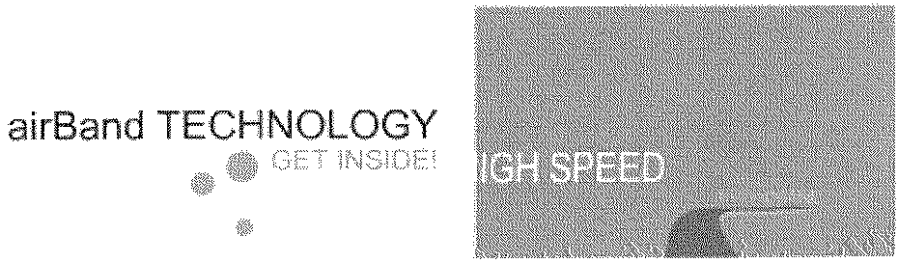

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